

13.53 QUANTITATIVE PRECIPITATION ESTIMATION BY X-BAND POLARIMETRIC RADAR NETWORK OF KOCHI UNIVERSITY

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Kochi prefecture is known to be the area where the heavy rains more than 50 mm/h in precipitation intensity and tornadoes frequently occur. Mean annual precipitation of Kochi city is 2500 mm. Though the X-band polarimetric radar network so called as XRAIN is constructed by the Ministry of Land, Infrastructure and Transport in order to observe heavy rain in Japan, it does not cover Kochi prefecture. So, we constructed Xband radar network in Kochi to complement XRAIN. At this time, we have 3 X-band polarimetric radars located at Asakura, Monobe and Aki. More two radars will be settled at Suzaki and Tosashimizu by the end of March 2018. We developed the Quantitative Precipitation Estimation (QPE) algorithm for the radar network and achieved quasi-real time QPE with 150 m special resolution. But the accuracy of the QPE for each radars seemed to be slightly different. The present study aims to evaluate the precipitation intensity observed by these radars.

We compared the hourly precipitation and the ten minutes precipitation observed by the radars with the data obtained by 12 rain gauges of Japan Meteorological Agency and our 13 rain gauges. The evaluation period is from November 2016 to October 2017. We used the data when the rainfall of 20 mm/h in intensity was observed from more than one rain gauge. For QPE, we employed K_{DP} -R relationship for heavy rain ($ZH \geq 30$ dBZ and $K_{DP} \geq 0.3$ deg./km) and Z-R relationship for weak rain. K_{DP} was eliminated if $h \nu \leq 0.6$, and ZH was corrected for attenuation by K_{DP} .

The preliminary results showed that all radars underestimated precipitation intensity. The slopes of regression lines were less than 0.9. Especially, the Z-R relationship underestimated more than the K_{DP} -R relationship. This fact may be caused by the local characteristics of drop size distributions. The correlation coefficient between the radar data and the rain gauge data was low; 0.63 for Asakura, 0.75 for Monobe and 0.68 for Aki due to mountain clutter and rain attenuation, though we employed the moving target indication and the attenuation correction with polarimetric parameters.

We will remove mountain clutter by mapping and redefine Z-R relationship by employing drop size distribution at Kochi. And we will also made complementation with each other radars in our radar network.